

1 ABSTRACT OF THE DISCLOSURE

2 Systems and methods are described here for locating the position of a mobile
3 terminal in a cellular communications system. A base station in the cellular
4 communication system broadcasts a communication signal having embedded therein a
5 navigation signal. The navigation signal uses a chirp technique in which the chirp signal
6 includes two portions, an up-chirp portion and a down-chirp portion. Each portion of the
7 chirp signal is synchronized with a frame in the communication signal. The chirp
8 navigation signal is at a power level much lower than the communication signal so as not
9 to interfere with the communication signal. A mobile terminal generates a corresponding
10 chirp signal to correlate with the incoming signal and to extract the navigation signal.
11 The mobile terminal uses the detected navigation signal to determine a time of arrival of
12 the communication signal for use in determining the position of the mobile terminal
13 either at the terminal or to send to a network center for location processing.